

1

3,297,617

COATING SLURRY CONTAINING AGGREGATE AND AQUEOUS EMULSION OF PETROLEUM-DERIVED HYDROCARBON RESIN

Joseph Regenstern, Jr., Chicago, and John C. Tapas, Glenview, Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill., a corporation of Illinois
No Drawing. Filed Dec. 23, 1963, Ser. No. 332,842
5 Claims. (Cl. 260—29.6)

This invention relates to sealing and coloring pavements. More particularly this invention relates to a coating composition and a method for its use in sealing and coloring pavements.

It is commonly known that pavements, particularly asphalt pavements, deteriorate with age, traffic loads, and changes in weather conditions. In deteriorating, these pavements often develop potholes and cracks, which allow moisture to seep through the pavement and erode the various subcourses under the pavement, thereby weakening the pavement and shortening its usefulness. Old pavements become brittle and readily chip and flake causing an uneven surface containing shallow potholes which prevent effective draining of moisture from the pavement. Pavements which are used for heavy traffic often develop grooves and the surface takes on a corrugated effect. Perhaps changes in weather conditions is the greatest factor in pavement deterioration. Changes in temperature and humidity, particularly relatively rapid changes, cause the pavement to expand and contract resulting in its buckling, cracking, crazing, and the like. Pavements which have deteriorated or are in the process of deteriorating require considerable maintenance, which most often consists of spot patching cracks and potholes with a variety of patch materials. In the past, repaving of the highway, street, or path was the only method of controlling the deterioration without relying on seasonal and often continuous maintenance.

Recently thin coatings of asphalt and asphaltic materials, either alone or in combination with aggregates, have been developed which seal the cracks and fill the potholes in the pavement thus restoring a smooth surface to the pavement, and eliminating the seasonal and continuous maintenance to a large extent. However, these coatings utilizing asphalt, and asphaltic materials, such as tar and like bituminous mixtures generally have poor ductility, cold temperature stability, feathering properties and the like, and the resulting coatings deteriorate in the same manner as the pavements. Also, when these coatings are applied to existing pavements which are of better construction and are more expensive, such as concrete, the coating often deteriorates at a faster rate than the existing pavement, requiring more extensive maintenance than would have been required without the coating and detracting from the advantages of the better constructed pavement.

In addition, the previously known coatings from asphalt and the like contain bitumens, which from its inherent nature are dark in color, preventing white, light colored, and colored surfaces on the pavements. Thus on dark pavements, such as asphalt pavements, the pavement retained its dark coloring upon coating; whereas on light colored pavements, such as expensive concrete pavements, the coatings resulted in dark surfaces which destroyed the benefit of the light-reflecting, durable light colored surface.

Therefore, it is one object of the present invention to provide a coating composition for sealing pavements and particularly cracks in pavements which does not deteriorate rapidly and results in a colored surface.

It is another object of the present invention to provide a coating composition which is easily applied and results

2

in a ductile, durable, sealed surface, and which has improved properties over asphalt coatings.

Still another object of the present invention is to provide a method for sealing and coloring pavement which is economical, rapid, and provides a durable, ductile, sealed surface.

These and other objects of the present invention will be apparent from the following description:

The composition of the present invention comprises paving aggregate, a solid alkaline material, pigment, water, and an aqueous emulsion of a mixture of hydrocarbon resin and oil, as hereinafter described.

More particularly, the aggregate suitable for use in preparing the composition of the present invention is a paving aggregate whose particles are of a size less than about 10 mesh, and preferably is selected from the group consisting of sand, slag, crushed gravel and mixtures thereof. The term "whose particles are less than about 10 mesh," denotes that the particles pass through a number 10 standard sieve, whose openings are squares having sides 0.0787 inch in length. The alkaline material can be any alkaline filler material commonly used as such in the art, whose particles are less than about 200 mesh, that is, the particles pass through a number 200 standard sieve whose openings are squares having sides 0.0029 inch in length. Especially preferred alkaline materials are Portland cement, hydrated lime, limestone dust and mixtures thereof. Similarly there are a number of various pigments and combinations of pigments whose particles are less than about 200 mesh size which can be used in the composition of the present invention. Among the suitable pigments are: titanium dioxide; lead chromate; lead chromate mixed with various amounts of lead sulfate; copper phthalocyanine; copper phthalocyanine with hydrogen atoms replaced with chlorine atoms; "molybdate orange" composed of lead chromate, lead sulfate and lead molybdate; iron oxide; natural and synthetic iron oxide reds; and the like. While almost any available water can be used in the present composition, it is preferred to utilize clear, potable water.

The essential ingredients of the aqueous emulsion utilized in the composition of the present invention are water and a mixture of substantially non-polymerizable, thermoplastic, light colored hydrocarbon resin produced by polymerization of unsaturated petroleum fractions; and oil selected from the group consisting of aromatic oil, naphthenic oil consisting essentially of a mixture of alicyclic hydrocarbons, and mixtures thereof, said oils being relatively viscous. An emulsifier for the resin and oil mixture is preferably utilized to form a stable resin and oil mixture-in-water emulsion.

In the resin and oil mixture described above, it is preferred to employ a substantially completely polymerized, aromatic, thermoplastic, hydrocarbon resin produced by polymerization of unsaturated petroleum fractions, e.g. by polymerization of "driplene," a commonly known mixture of unsaturated hydrocarbons obtained in the high temperature pyrolysis of normally gaseous hydrocarbons, the resin having a softening point range of from about 220° to about 300° F., a mixed aniline point of from about 20° to about 60° C., an iodine number of from about 40 to about 160, an acid number of from 0 to about 4, and a molecular weight of from about 600 to about 1700 as determined by cryoscopic means. Hydrocarbon resins of this description and having the properties defined herein can be readily prepared as described in U.S. Patent No. 2,798,866. This patent also defines the term "driplene."

It is also preferred to use as the oil in the resin and oil mixture described above, oil selected from the group consisting of aromatic oil consisting essentially of a mixture of highly viscous aromatic compounds, having a viscosity